21. Buffer neutralization : classic 3 acid + base at once problem.

☆☆ a buffer WA/WB + H^+

7 step A/B calc on a buffer WA/WB + OH^-

☆☆

Example $1 + A + OH \Rightarrow A^-$

here	here	here
$-x$	$-x$	$+x$
here$-x$	here$-x$	here$+x$

⇐ are all present in the problem

H.t: you can likely do this problem w/out the 7 steps

☆ Remember ☆ if 1:1 mix of buffer Then pH = pKa so add a some acid or base make pH change up or down a little From pH = pKa

Example

$K_a = 10^{-5}$

add a little acid

pH answer = ~4.8 or 4.9

33. ΔG, K, $\underline{E}$ good news, just know the relationships ~~[illegible]~~ grade[illegible]

ΔG + K<1 E(−)

ΔG − K>1 E(+)

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34 Balance redox : same as always, see rev of Ex3

not acid

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35. ranking of ox + red agents - same as rev of Ex3

I will give you a list 1/2 reaction. I will ask you to rank them.

Hint: I will do this by giving you a 1/2 reaction and asking what happen (E+) and doesn't.

Example

		$\underline{E}$	
$e^- + A^+ \rightarrow A$		−.5	} happen
$e^- + B^+ \rightarrow B$		−.2	}
$e^- + C^+ \rightarrow C$		+.4	← does not

if the following tries to oxidize $E = -.1$, $D^+ + e^- \rightarrow D$ which reactions happen?

37. Interpret a cell diagram. I will give you a chemical rxn. Make the shorthand for the reaction

$$Au^{+} + Cu \rightleftharpoons Au + Cu^{++}$$

$Pt/\underbrace{Cu|Cu^{++}}_{oxid} \,\|\, \underbrace{Au^{+}|Au}_{red}/Pt$ H.t. I gave the Pt electrodes.

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36. Stoich from current. This is so shpidly easy, you can do it in ½ of a second.

Hint: write down the ½ rxn and see # of e^{-} (n)

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38. Cell convention. Really easy. Know your task and answer which statements are true about it

spnt / nnspnt					

39. SHE reduction potential table. I will make 4 statements. One is false.

	E°
$A^+ + e^- \rightleftharpoons A$	$-.5$
$B^+ + e^- \rightleftharpoons B$	0
$C^+ + e^- \rightleftharpoons C$	$+1.5$

Hint. Know what every symbol means.

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40. SHE cell potential calc. $E^\circ_{cell} = E^\circ_{cat} - E^\circ_{anode}$

easy as pie

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41. Nernst calc. Really one of the easiest I've given. Make sure you know it. Make sure you write down balanced reaction so anode (ox) + cathode (red) are correct. The math is Really Easy.

42. assigning rate expression

$$2A \rightarrow 3B \qquad -\frac{\Delta[A]}{2\Delta t} = \frac{+\Delta[B]}{3\Delta t}$$

From This → get This

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43. rate expression calc.

If $A \rightarrow 2B$ and A has a rate of -3 per second

what is B? $+6$ per second

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44. units of rate constant. not 0, 1 or 2

so set up rate $= k[\ ]^x$

cancel units, and what is left is k

Hint M = mole l^{-1}

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45. method of initial rates. same old problem.

Hint, if order = 0 for one of the compounds,

then you can ignore its concentration change

46. int rate law.
classic plug and chug.
Find order of reaction then → $A = A_0 - akt$
→ $\ln A = \ln A_0 - akt$
→ $\frac{1}{A} = \frac{1}{A_0} + akt$

remember ratios like "45%" = $A_0 = 1$, $A = .55$

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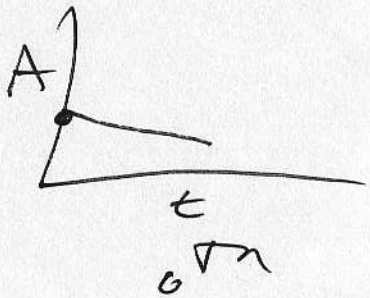
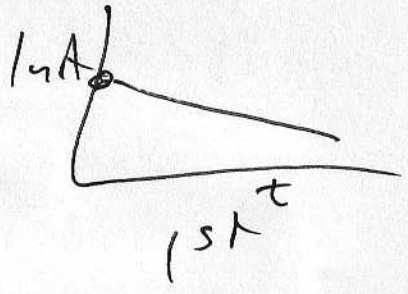
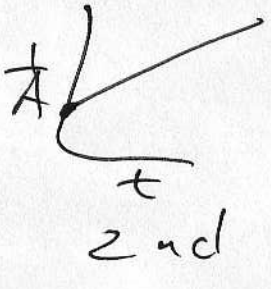
47. extract info from int rate law







these yield straight lines as follow

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48. kinetic theory. A lot of words. Mixes both collision and trans. state theory.
Hint 4 are correct, one is wrong

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49. Arrhenius theory. Hint
pre exp. factor: A matter here

50. combined Arithmetic : ~~that~~ This is that awful problem where you rearrange a giant combined eqn algebraically but don't solve

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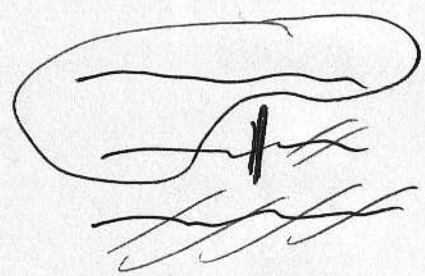
51. mechanism. Really easy version



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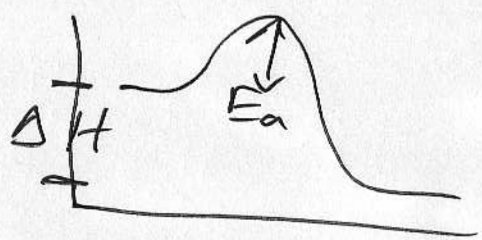
52. Ea + reaction profile



⟸ really easy version
Hint be ready for both endo + exo version

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53. catalyst. <u>not</u> cat converter

I will give you 4 statements, one is false

Hint. memorize the mechanism.

54. Know your allotropes

55. Know your metal reactivity

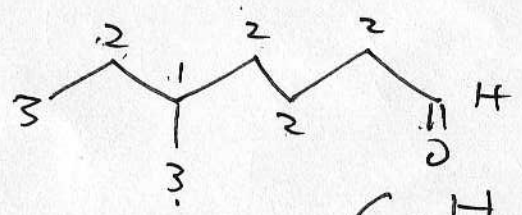
56. phosphorus NIVA

57. manufacturing rxn NIVA

reaction name : product

58. I will give a simple organic molecule name, you tell me the molecular formula

3 methyl heptanol



$C_8H_{16}O$

59. Know the functional groups that make polymers

60. Know the simple constituents of proteins, fatty acids, carbohydrate, nucleic acids

easy problem.